

CLAIMS:

1. A method of generating images suitable for use with a multi-view stereoscopic display including the steps of:

intercepting data passed from an application to an application programming interface, said data representing a scene or object to be displayed on said display, and wherein said data is intercepted by looking up an internal symbol table to determine a memory location for an application programme interface function, storing a modified library into memory, and redirecting application commands to said memory location to said modified library;

processing said data to render multiple views of said scene or object;

creating modified data by modifying said intercepted data to represent said multiple views;

passing said modified data to said application programming interface.

2. A method as claimed in claim 1 wherein processing of said data includes the steps of:

identifying replayable sequences of commands and processing said commands with valid sequences to minimize command flushing stages required.

3. A method as claimed in claim 1 wherein said multiple views are composed into a composite image

4. A method as claimed in claim 3 wherein said composite image is formed by mapping said multiple views to pixels on said display by:

$$N = \frac{(k + k_{offset} - 3l \tan \alpha) \bmod X}{X} N_{tot}$$

where  $k$  is a horizontal pixel index

$k_{offset}$  is horizontal shift of lenticular lens array

$\alpha$  is angle of the lenticular lens array

$X$  is views per lens

$N_{tot}$  is total number of views

and  $N$  is view number of each sub pixel  $k, l$

5. A method as claimed in claim 4 wherein N is rounded to a nearest integer value.

6. A method as claimed in claim 4 wherein image data for each pixel is determined by a weighted average of views having closest integer values to N.

7. A method as claimed in claim 4 further including the step of generating a modulation mask based on characteristics of said display, wherein

$$V_c = \frac{N_{tot}/3}{P_\mu}$$

$$V_r = \frac{N_{tot} \tan(\alpha)}{P_\mu}$$

where horizontal component of lenticular pitch is  $P_\mu$  and is derived from:

$$P_\mu = P \sqrt{1 + \tan(\alpha)^2}$$

where  $P$  is the lenticular pitch and  $\alpha$  is angle of the lenticular lens and  $N_{tot}$  is total number of distinct views;

and wherein for each colour component of a row of a raster scan a previous view is incremented by  $V_c$ , and for each row the view is incremented by  $V_r$ .

8. A system for creating images suitable for use with a multi-view autostereoscopic display including:

a capture means for intercepting 3D geometric primitives and associated characteristics passed between an application and an application programming interface;

a view generation means for imaging said 3D geometric primitives and said associated characteristics from multiple distinct viewing positions;

a mask calculation means for determining a relative contribution of each view based on characteristics of an associated lenticular lens array; and an accumulation means for combining said views with said masks to generate a composite 3D image.

9. A system as claimed in claim 8 wherein said capture means intercepts said primitives and characteristics by:

looking up an internal symbol table to determine a memory location for an application programme interface function;

storing a modified library into memory; and

redirecting application commands to said memory location to said modified library.

10. A system as claimed in claim 8 wherein said accumulation means includes:

a view calculator to determine which said view is assigned to each pixel of said 3D image.

11. A system as claimed in claim 10 wherein said view calculator determines said view by:

$$N = \frac{(k + k_{offset} - 3l \tan \alpha) \bmod X}{X} N_{tot}$$

where  $k$  is a horizontal pixel index

$k_{offset}$  is horizontal shift of lenticular lens array

$\alpha$  is angle of the lenticular lens array

$X$  is views per lens

$N_{tot}$  is total number of views

and  $N$  is view number of each sub pixel  $k, l$

12. A system as claimed in claim 8 wherein said mask calculation means determines a fractional proportion of each said view for each pixel of said 3D image.

13. A system as claimed in claim 8 wherein characteristics of said lens array are determined by:

$$V_c = \frac{N_{tot}/3}{P_\mu}$$

$$V_r = \frac{N_{tot} \tan(\alpha)}{P_\mu}$$

where horizontal component of lenticular pitch is  $P_{\mu}$  and is derived from:

$$P_{\mu} = P\sqrt{1 + \tan(\alpha)^2}$$

where  $P$  is the lenticular pitch and  $\alpha$  is angle of the lenticular lens and  $N_{tot}$  is total number of distinct views;

and where  $V_c$  represents the number of views per colour component and  $V_r$  represents the number of views per image row.

14.A system as claimed in claim 13 wherein said 3D image is traversed in a raster scan to form said composite image.

15.A system as claimed in claim 14 wherein a first position of said raster scan is initialized to an arbitrary view number.

16.A system as claimed in claim 15 wherein for each subsequent colour component in a same row of said raster scan a previous view is incremented by  $V_c$ .

17.A system as claimed in claim 16 wherein as said raster scan advances to a new row the view is incremented by  $V_r$ .